RESEARCH HIGHLIGHT

May 2004

Socio-economic Series 04-031

AN EXAMINATION OF THE USE OF DOMESTIC SPACE BY INUIT FAMILIES LIVING IN ARVIAT, NUNAVUT

INTRODUCTION

This study examines how well the designs of current northern housing suit the activities, cultural values, and lifestyles of contemporary Inuit families. Life in an Inuit community does not parallel life in southern Canada. Daily activities such as hunting, fishing, the upkeep of rifles, fishing nets, snow machines, as well as family values, entertaining, and visiting habits, define cultural values that differ considerably from those of Euro-Canadian society. Yet, since the 1950s, cost effective and durable Euro-Canadian-style houses have been built for Inuit households. The unique economic and cultural configurations of Inuit families have been largely left out of the design process.

OBJECTIVES OF RESEARCH

During the 1960s and 1970s, several studies were initiated by Canadian federal government agencies to examine how the switch to western housing had impacted on Inuit life. At the time, fieldworkers documented families butchering animals in living rooms, storing seal meat in bathtubs, drum dancing in living rooms and using kitchens to repair engines and firearms. But is this still the case today? To what degree do Inuit families continue to spatially graft their unique activities and cultural values onto the Euro-Canadian-style houses they currently occupy? And if so, then what effect has this had on domestic life, social interactions among friends and family members and the adequacy and durability of northern housing? Can new architectural principles be developed from the documentation of such differences that could assist in designing future houses that better reflect the lifestyles and cultural values of Inuit families? These important questions form the basis of this CMHC-funded research project, which combines ethnographic fieldwork with a computer-based method for analysing the spatial layouts of houses. This project was carried out in the Inuit community of Arviat, Nunavut, during the summer of 2002. Formerly known as Eskimo Point, Arviat is located on the western coast of Hudson Bay (Figure 1), and is currently home to approximately 2,000 people. Inuit families form the majority of the population and are broadly categorized as "Caribou Inuit;" a label assigned by ethnographers to all Inuit groups living on or near the west coast of Hudson Bay.

METHODOLOGY

Within any household, cultural values define perceptions of how compatible, or how private versus public, domestic activities

Figure 1: Map showing the location of Arviat, Nunavut

are. In some cultures, activities that are noisy or messy are spatially segregated from activities that demand concentration, or require clean work areas, because they are seen as incompatible. In other cultures, compatibility is seen as less of an issue and different activities are performed together at a single location. In addition, activities that have a social element are frequently situated in open, integrated areas, while those stressing individuality and privacy are located in areas that are less accessible and more visually secluded.

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Integration and visibility are therefore spatial attributes in houses that reflect and sustain the cultural values of their intended occupants. The division of open spaces into smaller rooms significantly alters the integration and visibility of interior areas relative to one another. Domestic activities are accommodated when the cultural values of the occupants match the spatial layout of the house. When this is not the case, household activities are spatially distributed in ways that can be disruptive to the household and potentially damaging to the house. By examining how the domestic activities of families are spatially sequenced throughout the house, in accordance with the attributes of integration and visibility, one can determine the compatibility of the house design with the lifestyles and cultural values of the family.

Over a period of two months, observations of the domestic activities of 47 Inuit households were recorded and mapped on the floor plans of their houses. Surveys were made by walking from room to room and recording all moving and stationary activities that were occurring at that moment. This "snap shot" was then transcribed onto a plan view of the house and coded according to the activity. The standard categories that were measured are listed in Table 1. Observations were taken at various times throughout the day, for example, meal times, mid-morning, mid-afternoon, and mid-evening. Households were recruited on a volunteer basis. The observations were then used to construct a Microsoft Access relational database of space use by Inuit families.

Table 1: Categories and subcategories of domestic activity

Cooking	Char	Eating	Caribou meat
	Caribou		Dried caribou meat
	Seal		Char
	Beluga		Dried char
	Bear		Beluga
	Narwhal		Narwhal
	Bannock		Bannock
	Cooking marrow		Country food
	Northern Store food		Tea/coffee
	Miscellaneous country food		Store-bought food
Hunting/Fishing	Butchering animals	Storing	Hides/hide clothing
	Cleaning char		Store-bought clothing
	Drying char		Hunting equipment
	Preparing hides		Sewing equipment
	Making dry meat		Tools
	Splitting bone for marrow		Toys
			Caribou meat
Sewing	Hide		Char
	Cloth		Bird eggs
			Seal mammal meat
Crafts	Carving		Northern Store food
	Jewelry		Large cooking pots
	Wall hangings		Miscellaneous
	Doll making		
	Miscellaneous	Socializing	Watching TV
			Playing with children
Maintenance	All terrain vehicles (ATV's)		Visiting with family and friends
	Snow machine		Eating country food with family
	Boat		Talking on CB radio
	Fishing nets		Listening to radio station
	Rifle		Smoking/chewing tobacco
	Komatiks (Sleds)		Drum dancing
	Miscellaneous		
		Personal Needs	Sleeping
Other	Using computer		Washing up
	Operating small business		Brushing teeth
			Laundry

A technique called *space syntax analysis* was next used to measure the integration[1] and visibility values of rooms within different northern house models. The floor plans were first broken up into discrete bounded spaces (rooms) and connected together by points of entrance and exit (doorways) (Figure 2). Next, the integration value of each room was calculated and "toned" according to its value: from dark (most integrated) along a scale of grey to white (least integrated). Figure 3 presents the processed floor plans of two house models currently used in Arviat: an Access four-bedroom house and a Coldstream three-bedroom house. Notice how the integration values of rooms change between the two house models. In the Access house, the central corridor is the most integrated space in the dwelling. Because most rooms open directly off this corridor, the integration values of other rooms tend to vary little. This differs significantly from the Coldstream house, where the living room is the most integrated space, and the integration values of rooms vary to a much greater degree.

Figure 2: Convex breakups of an Access 4-bedroom house (A) and a Coldstream 3-bedroom house (B)

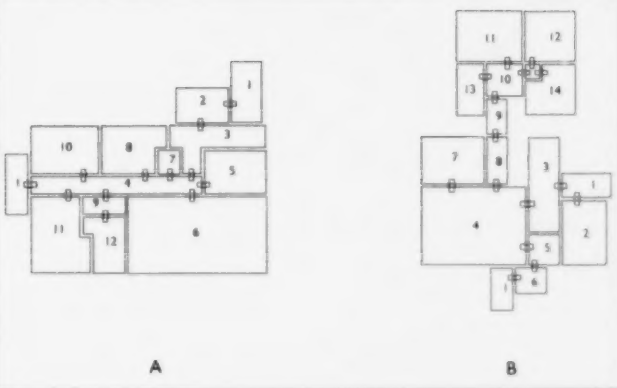
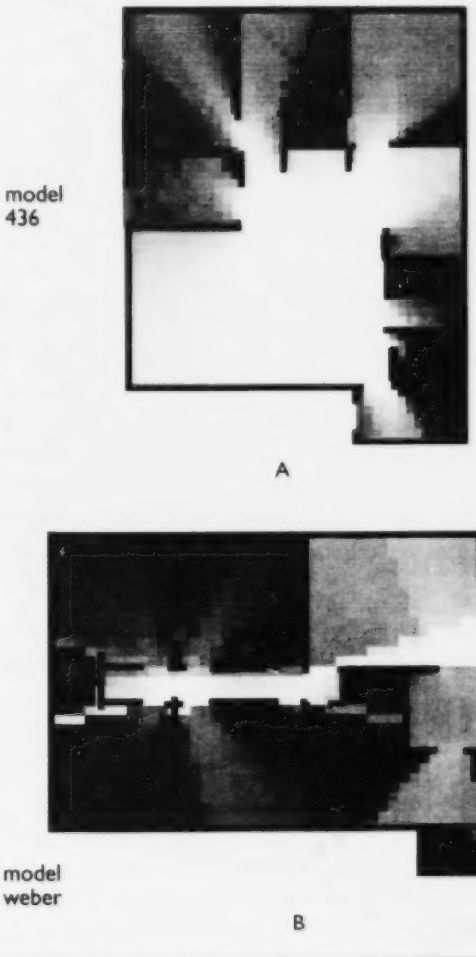


Figure 3: Processed convex breakups of an Access 4-bedroom house (A) and a Coldstream 3-bedroom house (B).

In order to examine how the visibility of the house interior changes as a function of wall and door placement, the floor plans of each of the house models used in the study were analysed in order to examine how much of the interior can be seen from different locations within the dwelling. The resulting *viewfields* are presented as cones that are toned according to the degree of visual obstruction. Highly visible areas produce wide cones that are lightly toned, while visually obstructed areas produce narrower cones that are darkly toned. By way of example, Figure 4 presents the visibility graphs of two house models used in Arviat: the model 436 built in the 1960s, and the Weber built in the 1970s. Notice how the floor plan of the 436 house generates viewfields that are much wider and more panoramic than the narrow viewfields of the Weber house.

Figure 4: Visibility graphs constructed for two northern house models



[1] Integration is a measurement that determines the spatial relationship of each room to all other rooms in a house. The more integrated the room, the shorter the average "trip" lengths required to access it from other areas of the house.

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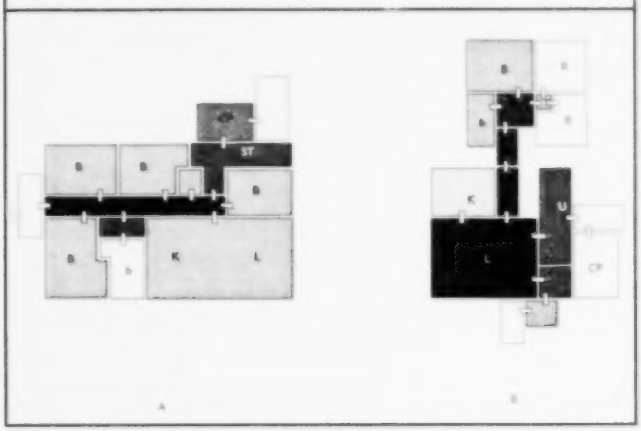

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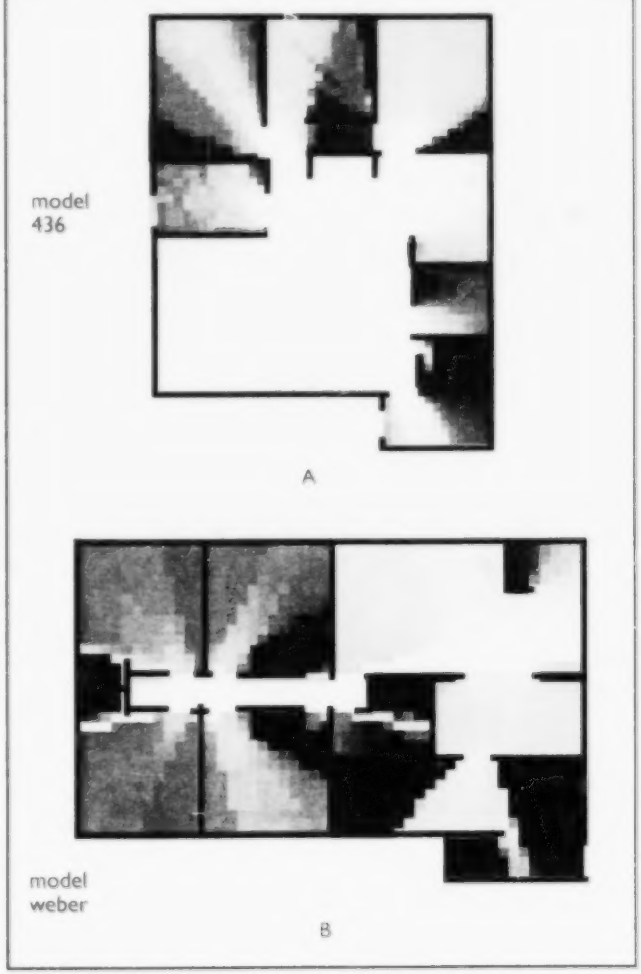

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The integration and visibility values calculated using space syntax analysis were next assigned to each domestic activity, based on its recorded location within the house, and plotted as graphs. This provided a means of assessing how the partitioning of interior space mediates the spatial distribution of activities throughout the house. In Figure 5, activity diversity is plotted as a function of room integration, with the size of the bubble corresponding to the range of activity types occurring at a given location. In Figure 6, categories of domestic activity are plotted against the integration values of the rooms in which they were most commonly observed. The size of the bubble corresponds with the number of times each activity was recorded during the study.

FINDINGS

Figure 5 demonstrates that Inuit families tend to concentrate a diverse range of activities in a few highly integrated spatial locations within the house. This stands in contrast to Euro-Canadian families, who tend to disperse their domestic activities more widely throughout the house, using specific rooms for specific activities. Space syntax analysis reveals that the relative integration values of living rooms, kitchens, bedrooms, storage and utility rooms and cold porches vary considerably across different northern house models. In some instances, areas within houses that are of limited use have the highest integration values. In many Access model houses, for example, the central corridor, which serves only as a route of movement, is the most integrated space in the dwelling. If Inuit families require highly integrated spatial locations for domestic activities, then this clearly does not make sense. In addition, the L-shaped living room and kitchen layout of houses such as the Access-5-bedroom model create visual obstructions that prevent family members from monitoring the activities and locations of others. In order to overcome this, the Inuit resident of one such house hung a large parabolic mirror on the wall of his living room.

Figure 6 indicates that socializing activities are the most frequently occurring category of activity in Inuit households and that they also tend to be situated in highly integrated spaces. This reflects the fact that socializing is a cultural activity which is highly valued among Inuit families, who visit each other's houses almost continuously. The Inuit extended family functions as a network of mutual support through which its members can access food, equipment, labor, money and emotional support. Consequently, socializing activities such as sewing by hand, child-minding, and the consumption of traditional foods provide opportunities for the continual re-affirmation of family bonds.

However, current house designs do not sustain these values because communal spaces such as living rooms and kitchens vary in integration and are too small to accommodate larger numbers of family members. The result is that furniture is often moved out of living rooms and/or kitchens to accommodate family members who regularly come together to take meals of traditional food.

Figure 5: Domestic activities plotted as a function on integration

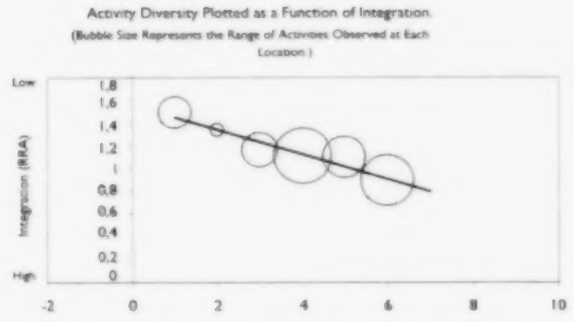
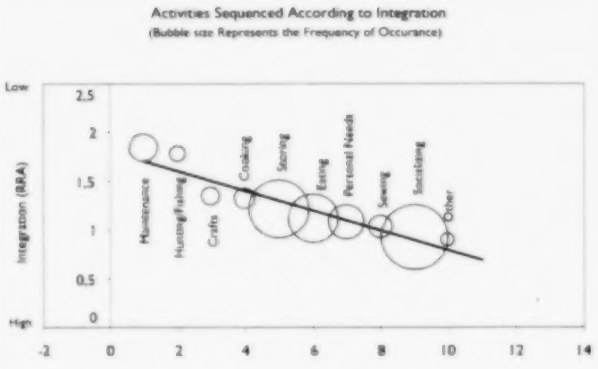


Figure 6: The sequencing of household activities according to integration



CONCLUSION

Many of the activity patterns that are unique to Inuit households could be better sustained by altering how the interiors of houses are subdivided. For example, by eliminating long central corridors, living rooms and kitchens could be connected more directly to other areas of the house. Ideally, these two spaces should be significantly enlarged and centrally located within the floor plan. This would have the effect of making them more integrated, visible, and comfortable for Inuit families. Interestingly, the trend in northern architecture has been in the opposite direction. Space syntax analysis of 16 northern house models used over the past four decades reveals a movement towards the increasing segmentation of interior space, resulting in greater numbers of smaller rooms that are connected together in ways that restrict the flow of human movement and visual information. In these houses, domestic activities are frequently crowded into small, poorly integrated rooms, or relocated to areas outside of the home, because they can not be properly accommodated. The overall effect is that the household is unable to operate efficiently because individuals and activities become spatially dislocated.

The increasing compartmentalization and restricted flow of visual information in Euro-Canadian house forms is entirely compatible with Euro-Canadian family values that stress privacy and individuality. They are, however, spatially incompatible with Inuit family values that stress integration and communality. At a recent meeting of the Canadian Association for Suicide Prevention, the results of an Inuit-supervised study on well-being, sadness, suicide, and change in two northern communities were presented. The results indicate that family was most commonly related to suicide prevention and intervention. Unhappiness was tied to not being with family and not visiting, and family bonding was listed as one of several essential elements of Inuit well-being. These findings demonstrate the importance of designing houses that are socially sustaining for Inuit families.

An understanding of how knowledge of traditional Inuit cultural values and architecture might assist in the design of better housing is currently being explored by the Nunavut Housing Corporation through Inuit *Qaujimajatuqangit* ("knowledge of all areas of life"). By asking Elders to share their knowledge of traditional architecture, new and innovative solutions to existing design problems could be developed. However, Inuit Qaujimajatuqangit is only one side of a two-sided coin. By combining Inuit Qaujimajatuqangit with field observations of space use by Inuit families, a more complete understanding of the housing needs of Inuit families can be obtained. To this end, the results of this study have produced a great deal of information that can be used to develop and marshal new and innovative housing strategies in the Canadian Arctic. Many of the recommendations that come out of this study should be relatively inexpensive and easy to incorporate into existing house designs.

RECOMMENDATIONS

- The construction of houses with more open floor plans generating wider viewfields that do not restrict the flow of visual information. This could be achieved by eliminating long central corridors from which other rooms are accessed. Instead, smaller rooms such as bedrooms, utility rooms and workshops would open directly onto a single, large open space.
- The integration of kitchen and living room into this single, enlarged space. This type of layout coincides with observational data which indicates that most family activities take place in the living room and kitchen.
- The construction of large, enclosed cold porches on the front of the house. This design modification is supported by observations of the need for cold porches in the facilitation of traditional activities, such as hunting and fishing. These enclosures should be fitted with a locking door to deter instances of theft.
- The elimination of multi-story dwellings in favor of single-floor dwellings. This would reduce the problem of the overheating of the second floor during the summer months, as well as widen viewfields throughout the house, thereby increasing its visual accessibility. This recommendation also addresses a preference for single floor dwellings expressed by the majority of Inuit families.
- The replacement of small, standard kitchen sinks with larger stainless steel sinks to accommodate traditional foods which tend to be larger and bulkier than store-bought western foods.
- The addition of more energy-efficient stoves with larger heating elements to accommodate the boiling of traditional foods, such as caribou meat in large cooking pots. Alternatively, the construction of outdoor brick fire pits so that large pots of meat can be brought to boil more quickly and efficiently.
- The construction of larger storage cupboards in kitchens to accommodate large cooking pots, which are important in the preparation of traditional foods.
- The addition of better ventilation systems to accommodate large amounts of condensation released during the boiling of traditional foods in large cooking pots.
- The addition of self-closing (spring-loaded) doors to reduce heating bills during cooler months. This would eliminate the problem of children and visitors leaving doors open when entering and exiting the house.
- The development and construction of more storage solutions for clothing, toys and other items used by Inuit families.

- The construction of elevated gravel pads along the sides of houses to serve as dedicated work areas for repairing snowmachines, All-Terrain Cycles (ATCs), boats, komatiks, etc. The elevation of these gravel platforms would deter people from driving in between houses and prevent the pooling of water. In addition, the gravel could be changed periodically to remove the accumulation of pollutants, such as oil and gas spills.
- The placement of skirting around the foundations of all houses, leaving southern sides open to warmer winds, thereby reducing heating bills.
- The replacement of all door hard ware (knobs, locks) with heavy duty industrial latches and handles.
- The attachment of vinyl or linoleum sheets to lower portions of interior house walls to reduce damage caused by scratching and drawing from children.

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